Environmental Protection

The ~~future~~ success of cities in the 21st century will ~~most likely~~, to a significant degree, be ~~judged~~decided by their ability to adapt ~~and meet the~~to challenges presented by ~~global~~ climate change and ~~the need~~ to become more sustainable ~~in their form~~ and ~~function~~resilient. This Environmental Protection Element contains ~~the~~ policies and actions required for the City of Raleigh to ~~begin meeting~~ meet these and other challenges~~,~~. In the process, the City will be improving the long-term health of local residents ~~and,~~ regional natural resources, and ecological systems. ~~In doing so~~By taking these actions, Raleigh will ~~become a model for cities in the southeastern United States, serving~~serve as a key player in the national reversal of sprawling development patterns and environmentally degrading development practices~~, with~~. Ultimately, the goal ~~of~~is to one day ~~becoming~~become carbon neutral~~.~~

while protecting natural resource assets and growing sustainably. The City of Raleigh has a number of ~~laudable~~ programs and initiatives ~~that are~~ designed to protect and enhance environmental and natural resources~~— such as~~. These include its broad array of recycling services, the greening of its automobile fleet, ~~toward~~the integration of green building and infrastructure programs, ~~and its attempts at~~ progress in reusing and conserving water~~.~~, and work in managing stormwater as an integral asset. Adoption~~,~~ and implementation~~, and enforcement~~ of this ~~Environmental Protection~~ Element presents the City ~~of Raleigh~~ with an opportunity to surpass these efforts~~,~~ and to continue to move toward more comprehensive solutions to ~~complex~~ environmental ~~problems.~~ challenges.

Raleigh's Climate Protection Commitment

~~As a member of the International Council for Local Environmental Initiatives (ICLEI),~~ Raleigh has joined forces with ~~other progressive~~more than a thousand cities ~~in~~across the country by signing the U.S. Mayors Climate Protection Agreement to strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution. The following actions from the Climate Protection Agreement shape the land use, transportation, and natural resource preservation policies in the Plan:

- Adopt and enforce land use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities.
- Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for carpooling, and public transit.
- Increase the use of clean, alternative energy by, for example, advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste-to-energy technology.
- Maintain healthy urban forests; promote tree planting to increase shading and to absorb carbon dioxide.
- Make energy efficiency a priority through building code improvements and retrofitting City facilities with energy efficient lighting to conserve energy.
- Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or similar system.

Some of the key issues this Element aims to address through its policies include:

- ~~The City will be challenged by the~~The localized effects of climate change, including increased risk of droughts and ~~flood~~flooding, and a fluctuating supply source of drinking water;

- The ~~City's recent commitment to helping to~~ fight against climate change at the local level will require coordinated responses involving City operations as well as land use and transportation policy;
- The Neuse River is ~~one~~a valuable natural water resource that is impaired by excess concentrations of the ~~most polluted rivers in the country,~~nutrients nitrogen and ~~as~~phosphorous. As the capital city, located near the headwaters of the Neuse River Basin, Raleigh must help lead and champion measures to protect this ~~degraded~~ state resource;
- The ~~City's~~ ongoing efforts to improve air quality must address the ~~region's~~region's high degree of reliance on the automobile, loss of tree coverage, and loss of undeveloped land;
- The conservation of urban, suburban, and native forests will be important to ~~Raleigh's~~Raleigh's environment and quality of life; and
- There is a need for greater sensitivity for aquatic and wildlife and natural habitat protection. Raleigh has the opportunity to become a national leader in sustainable environmental policy that helps protect and improve quality of life at the ~~national~~ local and regional level.

Further information associated with these topics, and how they relate to Raleigh, can be found in the Environmental Resources section of the City of Raleigh Community Inventory Report.

The following policies and actions are most directly related to the vision theme of Greenprint Raleigh. In fact, for the purposes of this Comprehensive Plan, the word ~~'greenprint'~~"Greenprint" simply refers to a plan for sustainability. Issues such as clean air and climate change, water quality and quantity, land conservation and habitat protection, and material resource management~~,~~ all influence urban sustainability.

~~However, achieving~~Achieving sustainability depends upon and plays a critical role in the fulfillment of ~~each~~all of the vision ~~theme~~themes, including not only Greenprint Raleigh, but also Economic Prosperity and Equity; Expanding Housing Choices; Managing Our Growth; Coordinating Land Use and Transportation; and Growing Successful Neighborhoods and Communities. ~~An environmentally focused,~~A collaborative stakeholder effort ~~on behalf of all parties working towards~~that considers people, the environment, and the economy will support the realization of each ~~vision~~ theme ~~will~~and be critical in transforming Raleigh into a truly sustainable city.

For example, urban sustainability is strongly related to the vision theme of Economic Prosperity and Equity. By enforcing policies that promote energy conservation and efficiency, the City of Raleigh is helping to insulate local business and residents from energy price increases by reducing the amount of energy used - and income spent - on heating and cooling, hot water, and lighting. Furthermore, "Green Collar" are created when large-scale investments are made in developing energy~~-~~-efficient infrastructure~~,~~. These jobs include such as solar panel installation, green roof installation, brownfield restoration, and ecological restoration~~, thereby further contributing~~. These investments, therefore, contribute to overall economic prosperity.~~H~~

Assessing City Progress: STAR Communities

Sustainability Tools for Assessing & Rating Communities (STAR) is a national certification system for benchmarking, assessing, and rating community-wide sustainability. Hundreds of communities across the nation are using the STAR rating system to benchmark and assess their communities. STAR evaluates communities based on social, economic and environmental sustainability. This "triple bottom line" approach to sustainability takes into account considerations that go beyond a narrow focus on environmental performance alone. This includes metrics pertaining to the local economy, workforce

development, poverty alleviation, and the equitable distribution of community services. In total there are seven goal areas and 44 sustainability objectives used to benchmark the community. The goal areas are:

1. Built Environment
2. Climate & Energy
3. Economy & Jobs
4. Education, Arts & Community
5. Equity & Empowerment
6. Health & Safety
7. Natural Systems

STAR is currently administered by Raleigh's Office of Sustainability, which has worked with other departments, local universities and community partners to collect data required for certification. In 2015, STAR Communities, the non-profit organization that evaluates and certifies municipalities, recognized Raleigh with a 4 star national excellence certification out of a possible five. Raleigh is the first city in North Carolina to receive this designation. The City is using this tool to guide the implementation of the city's Strategic Plan and Comprehensive Plan and as a factor in developing performance measures and departmental work plans.

Environmental policy also ~~influences~~addresses equity~~,~~ (and the vision theme of Growing Successful Neighborhoods and Communities~~,~~) through the promotion of environmental justice. ~~In essence,~~The concept of environmental justice ~~is the redressing of~~involves addressing inequitable distributions of environmental burdens such as air pollution, noise pollution, and noxious industrial facilities~~; and~~. It also includes equal access to environmental goods such as clean air and water, healthy and protected streams, parks, urban forests, recreation, and transportation. ~~As with all urban areas, as~~As greater equity in the distribution of environmental burdens and goods is achieved, better-positioned cities will be able to accommodate the increases in density that are needed to support transit and curtail sprawling development patterns.

In addition to promoting regional transit and density, this Element also supports transit-oriented development, mixed-use development, infill development, bicycle facilities, and other building blocks of sustainability that advance the vision themes of Managing Our Growth and Coordinating Land Use and Transportation. ~~Such~~These policies will take ~~more~~ cars off the road~~,~~ and ~~more~~ pollutants out of the air and water~~, while at~~. At the same time ~~expanding~~, they expand housing choices and ~~diverting~~divert development pressure from ~~Raleigh's few~~the region's remaining bucolic and natural landscapes.

Sustainability and Resilience

The concepts and goals of sustainability and resilience, which are woven throughout this Plan, are closely related and mutually supportive but not identical.

Fundamentally, sustainability refers to the ability to meet the needs of current residents while also protecting the ability of future generations to do the same. The concept includes not only environmental protection, but also economic and social considerations – the "triple bottom line" of sustainability.

Part of Raleigh's natural landscape includes the Neuse River, ~~one of the most polluted rivers in the state. In 2007, American Rivers~~ a ~~national organization~~major waterway that ~~advocates for healthy rivers identified~~has been environmentally degraded due in part to urban stormwater runoff containing excess nitrogen and phosphorus as well as runoff from agricultural operations. Raleigh comprises a small

proportion of the Neuse ~~as the eighth most endangered~~River basin, but as an urbanized area with large amounts of impervious surface, runoff from Raleigh is a significant contributor to contamination of the river. Polluted runoff can lead to algae blooms that block sunlight from reaching underwater vegetation and that consume dissolved oxygen in the ~~United States.~~ water, harming fish and other species.

In recent years, especially after events such as Hurricane Katrina, Superstorm Sandy, and lesspublicized localized flooding and other disasters, the concept of resilience has gained traction. Resilience is an operational philosophy that seeks to identify opportunities and challenges before they arise and to prioritize strategic investments and community capacity-building to better adapt to and recover from shocks and stressors.

Each of these two critical concepts plays an important role in the policies and actions contained in this Plan. In some cases, the concepts will overlap; in others, they involve their own distinct strategies. Ultimately, creating a more sustainable and resilient Raleigh will provide lasting benefits for current and future residents.

As a capital city and as a community at the headwaters of the river, Raleigh is uniquely positioned to champion the recovery and protection of this ~~degraded~~important natural resource. The Water Quality and Conservation section of this element outlines various strategies to make this goal of recovery a reality. Looking beyond the river, and at the watershed as a whole, both water quality and water quantity will play significant roles in the City's ability to meet the needs of its growing population. Streams within Raleigh should be valued; should meet their intended uses from a regulatory water quality perspective; and should be safe, stable, and fitting natural corridors for enjoyment and quiet reflection in the midst of urban activity.

Finally, regional air quality in the Triangle area has shown ~~some~~ improvement in recent years, but significant effort will be needed to sustain and expand upon ~~recent improvements~~this trend. Regional cooperation will be essential to meaningful progress in the enhancement of air quality. This Element's policies on energy security and climate change preparedness will help to ensure that Raleigh is doing its part for this regional and global environmental challenge.

Policies and actions of this element appear below. Numbers indicate their relationship to the ~~Themes~~themes, as follows:

1. Economic Prosperity and Equity
2. Expanding Housing Choices Characteristics
3. Managing ~~Our~~ Growth
4. Coordinating Land Use and Transportation
5. Greenprint Raleigh
6. Growing Successful Neighborhoods and Communities

Environmental Protection Rating Systems for Sustainability

Other rating systems that measure sustainability include Energy Star, the Better Buildings Challenge, and the Passive House Institute. These federal and nonprofit programs rate appliances and building practices based on energy efficiency.

Energy Star

Energy Star is a voluntary labeling program for energy efficient appliances, electronics, and office equipment administered by the Environmental Protection Agency. Branding with the Energy Star label has influenced technological improvements in electronics, and driven consumer decision making when purchasing appliances.

Better Buildings Challenge

The Better Buildings Challenge is a federal initiative administered by the Department of Energy. Launched in 2011 the goal is to improve energy efficiency by 20 percent in commercial, institutional and multifamily buildings. Participants agree to conduct an energy efficiency assessment, take action to improve energy savings and then report results to share cost effective approaches with other participants.

Passive House

Passive house is a building concept that cuts energy consumption by incorporating using high quality insulation, and windows that prevents loss of conditioned air infiltration of outside air. Energy from the sun is maximized in the winter and minimized in during warmer months. The Passive House Institute U.S. certifies building design based on strict quality assurance and quality control standards aimed at reducing energy consumption.

As the real estate and construction industries move ~~towards~~toward more sustainable practices, ~~third-party~~thirdparty rating systems have played an important role both in defining what constitutes a sustainable development practice, and also in certifying that such practices have been employed to a degree that the resulting structure or development can be labeled "green" or "sustainable."

LEED

The most ~~famous and~~ widely-used rating system for sustainable building practice in the U.S. is the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ of the U.S. Green Building Council (USGBC). The LEED system addresses three stages of building—design, construction, and operations—and has separate criteria for commercial, institutional, and residential construction; existing buildings versus new construction; and includes a new pilot program for rating neighborhood development. As stated on the USGBC's web site, "LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality."

Sustainable Sites Initiative

If the LEED system focuses primarily on sustainable building practices, a relatively new and evolving standard for sustainable site development and landscaping is being developed by the Sustainable Sites Initiative (SSI), an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the United States Botanic Garden to create voluntary national guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices.

~~C~~5.1 Energy Security and Climate Change Preparedness

Globally, cities are taking the lead in preparing for climate change by proactively conserving energy, using renewable energy resources, and improving air quality. Having the foresight to make investments in energy security by preparing residents, businesses, and local infrastructure will be a hallmark of successful cities in the 21st century. ~~As~~With the future potential of rising energy prices ~~rise~~stemming from the combined effects of fossil fuel depletion and public policies aimed at ~~avoiding~~minimizing climate change, those cities and regions that can be the most productive with the least amount of energy input will be best positioned to prosper.

The policies and actions of this section are included not only because of the City of Raleigh's responsibility to the health, safety, and welfare of constituents, but also because they represent a move towards the responsible use of limited resources in a growing world—and a desire to leave a better world for future generations. In practical terms, adoption and enforcement of the following policies could also translate to lower energy bills and cleaner air for local residents.

As with all urban areas, Raleigh's "carbon footprint" (amount of greenhouse gases produced) depends primarily upon the ways our built environment and our modes of transportation are designed, constructed, and used. Therefore, the following policies and actions concentrate on how best to approach these practices.

Policy EP 1.1

Greenhouse Gas Reduction

Promote best practices for reducing greenhouse gas emissions as documented through the U.S. Mayors' Climate Protection Agreement~~, the International Council for Local Environmental Initiatives (ICLEI), and the Sierra Club's Cool Cities Program.~~ (3, 4, 5) (See the Community Inventory Report for additional information on these programs~~.~~.)

Policy EP 1.2

~~Vehicle Electrification~~Alternative Transportation Options

Promote the ~~electrification~~adoption of alternative fuel vehicles and advanced transportation technologies, both public and private. (5)

Policy EP 1.3

Total Cost of Ownership Analysis

Use Total Cost of Ownership (TCO), life-cycle analysis, and/or payback analysis on all energy saving proposals. (5)

Policy EP 1.4

Green Building

Advance green building practices in the public and private sectors by encouraging LEED Gold-level certification and LEED-ND, or their respective equivalents. (5)

Policy EP 1.5

LEED Certification for Public Buildings

All new or renovations of existing City of Raleigh buildings encompassing 10,000 gross square feet or more of building area should achieve a Silver level certification of the U.S. Green Building Council's LEED Green Building Rating System for New Construction (LEED-NC) and Existing Buildings (LEED-EB), or their respective equivalents. A higher equivalent rating (Gold or Platinum) should be sought where practical and as funding is available. (5) (See text box: LEED Certification for New and Existing Municipal Buildings).

Policy EP 1.6

LEED and Development Agreements

Require any public-private project that includes a development agreement to apply LEED (or the equivalent) certification standards as appropriate to the project and consistent with other Comprehensive Plan policies. (5)

Policy EP 1.7

Sustainable Development

Promote the adaptive use of existing buildings, infill development, and brownfield development as effective sustainability practices that take development pressure off undeveloped areas. (See also Element J: 'Historic Preservation' for more on this topic). (2, 3, 5, 6)

Policy EP 1.8

Sustainable Sites

Encourage the use of environmentally-friendly site planning and landscape design approaches and techniques such as those developed by the Sustainable Sites Initiative. ~~(5)~~ Incorporate sustainable green infrastructure and low impact development practices to help control stormwater runoff and reduce pollutant impacts to streams. (5)

Policy EP 1.9

Sustainable Public Realm

Incorporate sustainable technology and materials into public realm projects. (5, 6)

Policy EP 1.10

Alternative Energy Sources

Support the development and application of alternative energy sources, renewable energy technologies ~~such as active, passive~~, and ~~photovoltaic solar energy, fuel cells, and other sustainable sources~~energy storage. Such technology should be used to reduce the dependence on imported energy, provide opportunities for economic and community development, and benefit environmental quality. (5)

Policy EP 1.11

Renewable Energy

By 2030, increase the use of renewable energy to meet 20 percent of Raleigh's peak electric load, or maximum electric demand that is typically reached during normal business hours. This target will be ~~re-evaluated~~reevaluated as additional research and information becomes available. ~~(5) *See text box: NC GreenPower.*~~ (5)

Policy EP 1.12

Air Quality Improvements

Reduce the number of air quality days categorized as 'unhealthy' or 'hazardous,'' based on the Air Quality Index readings provided by the North Carolina Department of Environment and Natural Resources, Division of Air Quality. (5)

Policy EP 1.13

Evaluating Development Impacts On Air Quality

Evaluate potential air emissions from new and expanded development, including transportation improvements and municipal facilities, to ensure that measures are taken to mitigate any possible adverse impacts. These measures should include construction controls to reduce airborne dust and requirements for landscaping and tree planting to absorb carbon monoxide and other pollutants. (5)~~ 115~~

~~**NC GreenPower**~~

~~To increase the use of electricity generated from renewable resources, such as solar, wind, biomass, and water, the City of Raleigh could lead by example by participating in the statewide program NC *GreenPower*. The program enables energy providers to sell blocks of energy from renewable resources, and is offered through most private utilities in North Carolina, including Progress Energy in Raleigh~~

~~**Adopted Fossil Fuel Reduction Goal**~~

~~The City of Raleigh has established a goal, adopted by the City Council on April 17, 2007, of reducing fossil fuel consumption by 20 percent from 2006 levels by 2011. The goal assumes that a 20 percent reduction is made from a baseline year and does not include a growth variable. For example, if the City consumes 100 gallons of fossil fuels in 2006, the goal is to have fossil fuel consumption at 80 gallons by 2011 regardless of growth. This will require even higher reduction rates when normalized on a per capita basis. To achieve this goal, the City is targeting three initiatives:~~

- ~~Establishing a citywide fossil fuel budget;~~
- ~~Investing in the transformation of the City's vehicle fleet; and~~

- ~~Broad changes in protocol and policy, ranging from encouraging telecommuting to shared service calls.~~

LEED Certification for New and Existing Municipal Buildings

~~On May 20, 2008 the City Council adopted as policy the Environmental Advisory Board's recommendations on~~ LEED ~~(or the equivalent) certification for municipal buildings, as follows:~~

New Construction

~~(1) All new City of Raleigh construction and additions encompassing 10,000 gross square feet or more of building area should achieve a Silver level certification of the US Green Building Council's LEED Green Building Rating System for New Construction (LEED – NC). A higher equivalent rating (Gold or Platinum) should be sought where practical and as funding is available.~~

~~(2) All City of Raleigh construction and additions encompassing less than 10,000 square feet of building area would not seek LEED Silver level certification but would be designed and built to be eligible for Silver certification, plus meet requirements for energy and water efficiency as follows:~~

~~i. Energy~~

~~Achieve minimum energy efficiency of 30% better than code required by the American Society of Heating, Refrigeration and Air Conditioning Engineers(ASHRAE) 90.1-2004 (ASHRAE 90.1 version required in the 2006 NC Building Code).~~

~~ii. Water~~

~~Achieve a 30 percent water use reduction as quantified by LEED water efficiency standards.~~

Existing Buildings

~~(3)~~ All existing City of Raleigh buildings and facilities should use the US Green Building Council's LEED Green Building Rating System for Existing Buildings (LEED—EB) as a guide. The application of these standards is intended to maximize sustainability benefits within existing resources and provide a means of benchmarking environmental and financial performance improvements in City practices.

Certification of existing buildings under LEED—EB should be evaluated for technical and economic feasibility and pursued at the highest feasible level of certification on a case by case basis as funding and resources are available. On May 20, 2008 the City Council adopted as policy the Environmental Advisory Board's recommendations on Leadership in Energy and Environmental Design (LEED) or equivalent certification for municipal buildings, as follows:

New Construction

(1) All new City of Raleigh construction and additions encompassing 10,000 gross square feet or more of building area should achieve a Silver level certification of the US Green Building Council's LEED

Green Building Rating System for New Construction (LEED—NC). A higher equivalent rating (Gold or Platinum) should be sought where practical and as funding is available.

(2) All City of Raleigh construction and additions encompassing less than 10,000 square feet of building area would not seek LEED Silver level certification but would be designed and built to be eligible for Silver certification, plus meet requirements for energy and water efficiency as follows:

i. Energy Achieve minimum energy efficiency of 30% better than code required by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) 90.1-2004 (ASHRAE 90.1 version required in the 2006 NC Building Code).

ii. Water Achieve a 30 percent water use reduction as quantified by LEED water efficiency standards.

Action EP 1.1

Reserved

Action EP 1.2

Reserved

Action EP 1.3

Energy Retrofits

Implement a retrofitting program for public buildings based on the "Public Facility Energy Audit" to maximize sustainability benefits within existing resources.

Action EP 1.4

~~**LEED-EB**~~

Leadership in Energy and Environmental Design-Existing Buildings (LEED-ND)

Evaluate the certification of existing public buildings under LEED-Existing Buildings (EB) (or the equivalent) for technical and economic feasibility and pursue the highest feasible level of certification on a case-by-case basis as funding and resources are available.

Action EP 1.5

~~**LEED-ND**~~

Leadership in Energy and Environmental Design-Neighborhood Development LEED-ND)

Explore adopting the U.S. Green Building Council's Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND), or the equivalent, as a City standard.

Action EP 1.6

Leadership in Energy and Environmental Design (LEED) Incentives

Encourage and provide incentives for buildings that would qualify for Gold or Platinum LEED certification, or the equivalent.

Action EP 1.7

Reserved

Action EP 1.8

Solar and Co-generation Incentives

Study and consider financial incentives to encourage homebuilders and home owners to install solar and other co-generation technologies.

Action EP 1.9

Energy Efficient Construction

Study and adopt LEED-like energy efficient construction standards that can be used when older buildings are renovated or adapted for new uses, since it may be difficult for older buildings to meet LEED standards.

Action EP 1.10

Community Supported Energy

Explore opportunities to develop Community Supported Energy (CSE) options which allow homeowners, landowners, farmers, co-operatives, schools, and others to install renewable energy projects up to 10 megawatts in size and to sell power to the grid for a fixed price.

Action EP 1.11

~~**Rooftop**~~**Renewable Energy**

Explore using the rooftops and other portions of public facilities and parking garages for renewable micro-power generation, such as solar and wind. ~~Also explore the appropriateness and feasibility of instituting solar access regulations.~~

Action EP 1.12

Solar Access

Explore the appropriateness and feasibility of instituting solar access regulations.

Action EP 1.13

Charging Stations

When viable, install charging stations for electric automobiles in public parking lots and garages.

Action EP 1.14

Fleet Transformation

Implement the City's Fuel and Fleet Transformation Plan.

5.2 Design with Nature

The State of North Carolina is known for its natural beauty. As the capital city of North Carolina, Raleigh should aspire to conserve ~~and~~, preserve, and restore the natural resources that define the City's "sense of place~~" and green infrastructure.~~." The design of the City should reflect ~~Raleigh's~~Raleigh's commitment to ~~protecting~~protect and enhance its natural resources and ~~enhancing its~~ environment. ~~Design~~Designing with nature ~~is more than the development and stewardship of a first-class park and greenway system. Rather, it~~ is a commitment to understanding the ecological significance of place and to grow the community in a manner that both respects and ~~takes advantage~~leverages the benefits of natural resources. An "ecosystem" approach to sustainable growth should become the hallmark of how the City grows and flourishes. The focus of such an approach is not growth versus no growth, but rather on the type of growth and development that occurs and where it occurs. The following policies and actions help to guide growth and development, thereby conserving, protecting, and enhancing Raleigh's natural resources. See also Element F: 'Parks, Recreation, and Open Space' for more on this topic. ~~Environmental Protection 118~~

Policy EP 2.1

Natural Resource Protection Green Infrastructure

Ensure protection of Raleigh's unique and significant ~~green infrastructure~~natural resources – its natural ~~resources~~areas, landscapes, and ecological systems – through best practices management, stewardship, conservation, restoration, and land use regulations. (3, 5)

Policy EP 2.2

Environmentally Sensitive Development

Ensure Raleigh's growth and land development practices are compatible with the City's natural form, vegetation, topography, ~~and~~ water bodies and streams, floodplains, wetlands, and other natural riparian assets. This will decrease erosion, reduce stormwater run-off and flooding, improve water quality, protect wildlife habitat, and provide buffers and transitions between land uses. ~~See **Map EP-1: Greenprint** for environmental resources.~~ (3, 5)

Policy EP 2.3

Open Space Preservation

~~Seek to identify all~~Identify opportunities to conserve open space networks, mature existing tree stands, steep slopes, floodplains, ~~priority~~wetlands, and other sensitive riparian areas, priority aquatic and wildlife habitats, and significant natural features as part of public and private development plans and targeted acquisition. (3, 5, 6)

Policy EP 2.4

Scenic Vistas and Views

~~Explore options for protecting and creating~~Protecting and create scenic vistas and views of natural landscapes and features that are important in establishing, enhancing, and protecting the visual character of the City, mindful of other goals such as preserving and enhancing the ~~City's tree canopy. (5)~~ City's tree canopy. (5) Policy EP 2.5 Protection of Natural Water Features Protect, restore, and preserve Rivers, streams, floodplains, and wetlands. These water bodies provide valuable stormwater and surface water management and ecological, visual, and recreational benefits. (3, 5)

~~**Policy EP 2.5**~~

~~**Protection of Water Features**~~

~~Lakes, ponds, rivers, streams, and wetlands should be protected and preserved. These water bodies provide valuable stormwater management and ecological, visual, and recreational benefits. (3, 5)~~

Policy EP 2.6

Greenway System

Continue to build a park and greenway system that is: interconnected; protects native landscapes, water quality, and areas of ecological significance, such as priority wildlife habitats; and serves the broad and diverse outdoor recreation needs of community residents. (1, 3, 4, 5, 6)

Policy EP 2.7

Road Design and Landscape Preservation

Encourage the preservation and restoration of natural features and systems when designing new roadways by separating in-bound and out-bound lanes as they pass through natural features such as large clusters of trees, rocky outcrops or watercourses. (3, 5) See also Element B: 'Transportation'

Action EP 2.1

~~**Green Infrastructure Plan**~~

~~Complete~~**Natural Resources Inventory**

Develop a ~~Green Infrastructure Plan that includes a natural heritage inventory~~Natural Resources Inventory to define a program for protecting, conserving and stewarding ~~Raleigh's~~Raleigh's natural ~~resources~~areas, wetlands, waterbodies, urban forests, landscapes, priority wildlife habitats, and important natural features, emphasizing their value in terms of carbon sequestration. Work with the Environmental Advisory Board and similar citizen committees as appropriate. Incorporate the spatial ~~principals~~principles of landscape ecology in ~~the~~ planning ~~effort.~~ .

Action EP 2.2

Park Acquisition

Annually acquire a minimum of 250 acres of land for parks, greenway corridors, or open space to meet the Raleigh Parks Plan's goal~~-~~.

Action EP 2.3

~~**Green Infrastructure**~~**Natural Resources Sustainability Team**

~~Establish a green infrastructure team~~ Continue the work of the Natural Resources Sustainability Team within City government ~~that is comprised of~~comprising the ~~City's~~City's Sustainability Coordinator and members from the City ~~Manager's~~Manager's office, Planning, Parks and Recreation, Public Utilities, Transportation, and ~~Public Works~~Engineering Services departments. The purpose is to develop a program of action, built upon the recommendations of the ~~green infrastructure~~natural resources inventory plan, for ~~day-to-day~~ implementation of these recommendations. This multi-disciplinary team will also help support the ongoing implementation of the City's green stormwater infrastructure and low impact development practices.

Action EP 2.4

Environmentally Sensitive Development Controls

~~Study and consider opportunities to encourage reduction of~~ Reduce excessive cut and fill grading and the ~~destruction~~loss of significant trees, vegetation, and Priority Wildlife Habitats (as identified by programs and agencies such as the North Carolina Natural Heritage Program and North Carolina Wildlife Resources Commission).

Action EP 2.5

Reserved

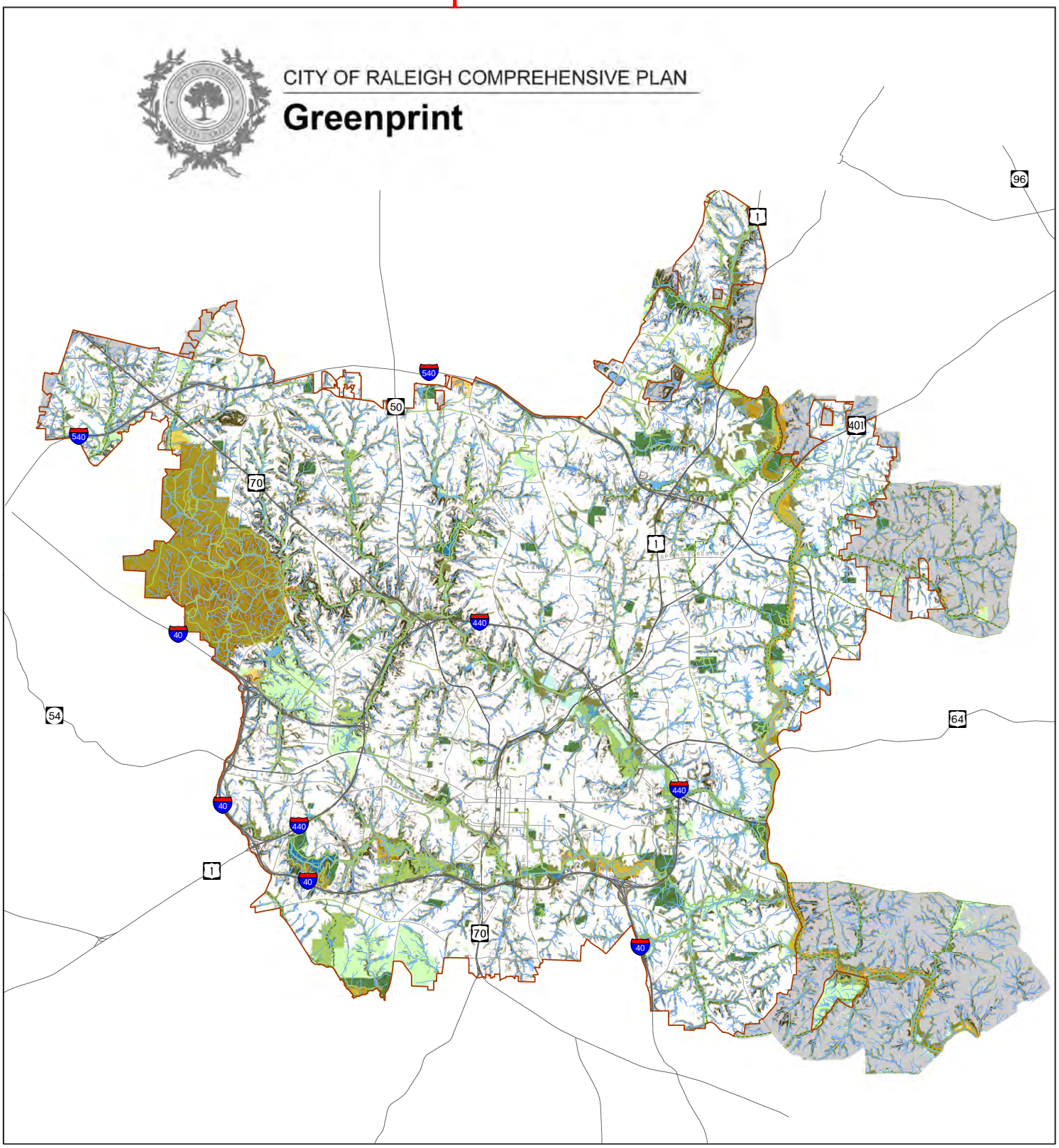
~~**Action EP 2.**~~**5**

Reserved

~~**C**~~**.3 Water Quality and Conservation**

The City of Raleigh has a responsibility to current residents~~ and~~, future generations, and those living downstream to ~~immediately~~systematically improve the health of local rivers, creeks, floodplains, and wetlands~~,~~ — and to continue to protect these resources ~~for~~over the long term. Water quality and conservation strategies should recognize that the meaning of "water" depends on context. In its most common context, it is the potable water provided by the City in pipes to homes and businesses. In the context of nature, it is what sustains our streams, lakes, wetlands, and the Neuse River and their habitats for wildlife, provides the needed supply source for "making" our potable water, and flows through other cities and towns to Pamlico Sound and the Atlantic Ocean. Local streams also are important to the history and heritage of Raleigh. Early explorers used local waterways as landmarks and travel routes, and settlers established villages and industries along their banks. These ~~elements of the City's green infrastructure cannot continue to~~important natural resources aided in the establishment of Raleigh and should not be

Map Removed



MAP EP-1

- Greenway Trail, Existing
- Greenway Trail, Planned
- Streams and Creeks
- Significant Natural Heritage Areas
- Slope>=15%
- Lakes and Ponds
- Public & Private Open Space
- Parks
- Greenway Corridors
- Hydric soils
- Floodplain
- Urban Service Area
- ETJ
- Highway
- Major Streets

N

0 0.5 1 2 Miles

Map created 10/7/2009 by the City of Raleigh
Department of City Planning & GIS Division

compromised, as they represent a direct lifeline to the vitality of the City as a whole: without ample, clean water ~~resources, the City of~~, Raleigh cannot ~~survive~~be prepared to manage long-term droughts, much less thrive with current and projected ~~levels of population.~~ populations.

The core goals to be fulfilled by these water quality and conservation policies include: keeping and treating rainfall on-site or as close to site as much as possible, thereby mimicking the flow of water in a natural setting and reducing non-point source pollution from stormwater run-off; increasing water conservation measures, and reducing overall demand for water; minimizing soil erosion and sedimentation; reducing ~~flood damage~~hazardous and damaging flooding; and reducing nutrient loads.

See also Element G: 'Public Utilities' for additional policies and actions.

Policy EP 3.1

Water Quality ~~BMPs~~ SCMs

~~Use non-structural Best Management Practices (BMPs) in an effort~~To complement structural controls, use nonstructural Stormwater Control Measures (SCMs) to improve water quality, such as public education programs, monitoring and control of illicit discharges, expansion of the greenway concept to include "~~receiving lands" that can absorb storm surge overflows,~~safe floodplain connection and ~~update~~activation, and ongoing implementation of the City's sediment control program ~~with an orientation toward performance measures~~. (5)

Policy EP 3.2

~~Neuse River~~ Protection

of Local Streams and the Neuse River Protect and preserve local streams and the Neuse River ~~watershed~~, primary channel, major tributaries, intermittent headwaters streams, floodplains, and topography to improve overall water quality for drinking, fish and wildlife habitat, and fishing, boating, and other recreational uses. (3, 5)

Policy EP 3.3

Drinking Water Supply Protection

Protect major drinking water supply overlay districts through preservation of open space ~~conservation~~, community programs that promote tree coverage, floodplain ~~preservation,~~protection and restoration, and sustainable limits to impervious surface cover. (3, 5)

Policy EP 3.4

Low Impact Systems for Parking

Well maintained ~~pervious~~permeable pavement ~~or~~and other low impact systems for parking areas should be encouraged throughout the City, especially in environmentally sensitive areas and floodplains~~, as appropriate.~~. (5)

Policy EP 3.5

Watershed-Focused Planning

Water quality ~~shall~~and flooding should be managed using a watershed-focused approach. Such an approach uses performance-based strategies to enhance water quality and prevent or decrease ~~downstream~~ flooding concerns in each watershed rather than applying citywide standards. (5)

Policy EP 3.6

Maintaining Drinking Water Quality

Improve the ecological integrity of the City's primary drinking water sources by further protecting streams from encroaching development and expanding the protection of stream buffers. (3, 5)

Policy EP 3.7

~~**Preserving Watercourses**~~

Protecting and Restoring Streams Preserve and restore the natural character of ~~watercourses~~local and area streams and waterways through greenway acquisition, floodprone area regulation, purchase of properties in Neuse River Buffer and floodprone areas, drainage corridor and buffer protection, and improved public and private design and construction practices~~.~~ including but not limited to stream stabilization and restoration. (3, 5, 6)

Policy EP 3.8

Low Impact Development

Promote the use of Low Impact Development (LID) techniques to help mitigate the impact of stormwater runoff. This includes the use of green roofs, rain gardens, cisterns, rain barrels, and ~~on-site wastewater reuse systems~~other measures in urban and suburban landscapes. (2, 5)

Policy EP 3.9

Drinking Water Conservation

Promote ~~water~~ conservation of potable water supply, even during periods of adequate supply, not just during drought. ~~Water~~Potable water conservation saves energy and normalizes practices, which will help the City cope with the ups and downs of rainfall patterns. (3, 5)

Policy EP 3.10

Groundwater Protection

Protect groundwater from the adverse effects of development. Land development and use should be managed to reduce the likelihood of groundwater contamination. (3, 5)

Policy EP 3.11

Water Supply Watershed Protection and Open Space

Continue to support and develop programs that protect open space lands in ~~Raleigh~~Raleigh's water supply watershed protection areas such as the Upper Neuse Water Supply Watershed and the Little River Water Supply Watershed. (3, 5)

Policy EP 3.12

Mitigating Stormwater Impacts

Potential stormwater impacts from new development on adjoining properties should mimic pre-development conditions and control the peak rate of runoff and/or volume of runoff so as to avoid flooding of adjoining and downstream properties, erosion of stream banks, ~~inundation of natural waterways~~ and to allow the recharging of groundwater. The intent is to avoid environmental and economic damage to the adjacent properties ~~and~~, City infrastructure, and receiving surface waters. (3, 5, 6)

Policy EP 3.13

Erosion ~~BMPs~~

~~Best Management Practices (BMPs) should~~**Control Measures** Erosion control measures should continue to be used on all construction sites to control soil erosion and minimize sediment run-off. (3, 5)

Policy EP 3.14

Wastewater Reuse

~~Consider~~Expand wastewater recycling/reuse systems at wastewater treatment facilities to further reduce the nitrogen and phosphorus load to the Neuse River system and to reduce potable water consumption for non-essential purposes. (3, 5)

Policy EP 3.15

Grading Controls

Pursue a risk-based analysis approach to prevent soil erosion by limiting the amount of disturbed areas allowed and restricting mass grading as much as practicable. (3, 5)

Policy EP 3.16

Collaboration for Managing Stormwater ~~Management~~

Pursue stormwater management initiatives that benefit and support the city and region by participating in countywide ~~and~~, regional, and statewide partnerships to develop innovative ~~and~~, consistent, and sustainable practices. (1, 3, 5)

Policy EP 3.17

Graduated Water Rates

Use rate structures to encourage water conservation by providing incentives to customers for reduced water usage. (1, 3, 5)

Policy EP 3.18

Green Infrastructure~~Action EP 3.1~~

~~**Demonstration Projects**~~

Continue to improve surface water quality and protect water resources through the design, construction, and installation of green infrastructure (GI) for city projects and facilities. Green infrastructure uses vegetation, soils; as well nonnatural materials to absorb and filter polluted water that would normally runoff impervious surfaces directly into a waterway. Low impact Development (LID) incorporates many of the principles related to Green Infrastructure. Widespread use of Green Infrastructure will also better prepare Raleigh for the effects of climate change along with managing the quality and quantity of stormwater runoff. Action EP 3.1 Demonstration Projects Work with other City departments, regional partners, and the local development community to promote demonstration projects within the City of Raleigh that use multiple water conservation measures on single sites. Incorporate Best Management Practices (BMPs) such as green roofs, bioretention cells, permeable pavers, large- and small-scale rainwater harvesting, and similar innovative ~~wastewater treatment and re-use systems, and grey water.~~projects. Offer incentives, such as grants, fee waivers, expedited review, tax breaks, and/ or density bonus or transfer provisions for participating in demonstration programs.

Action EP 3.2

Incorporation of Green Infrastructure/Low Impact Development ~~Ordinance~~ into City Code

Develop and adopt ~~an incentive based~~ Low Impact Development (LID) ~~ordinance~~and Green Infrastructure (GI) code and provisions so that rainwater is retained and absorbed on-site as an alternative to traditional approaches that include piping, channelization, and regional detention.

Create templates, facts sheets, and cost estimating tools to help administer the GI/LID ordinance at development sites and within the public right of way. Develop incentives for GI/LID such as stormwater utility fee credits, stormwater quality cost share, public-private partnerships, permitting incentives, and other.

Action EP 3.3

Drinking Water Conservation ~~Measures~~

Monitor drinking water conservation efforts ~~to date~~ to measure reduction by residents, businesses, government and institutions. Continue to promote efficiency and the value of water though public education. Prepare and publish an annual report on the per capita water use of all customer classes.

Action EP 3.4

~~**Water Quality**~~ Stormwater Management Projects

for Water Quality Identify, prioritize, and retrofit specific sites in the City of Raleigh where water quality management projects can be installed in existing developments.

Action EP 3.5

Illegal Discharges

~~Identify~~As required by the City's EPA NPDES MS4 Stormwater Discharge Permit and City code, continue to identify and eliminate illegal discharges into the City's sewer and stormwater systems and its waterways through public education and awareness, inspections, and enforcement.

Action EP 3.6

~~Land Acquisition for~~Maintenance of Private Stormwater ~~Control~~

~~Consider a program of action for acquiring the necessary land and/or~~**Facilities** Maintain easements ~~to provide for the maintenance~~and facilities acquired and constructed as part of the ~~stormwater system on private property~~City's Drainage Assistance Program.

Action EP 3.7

Stormwater Plan Review

Review all stormwater management plans for new development and redevelopment with a critical evaluation of approaches to nitrogen reduction as well as downstream flooding and erosion reductions.

Action EP 3.8

Reserved

Action EP 3.9

Upper Neuse Initiative

Continue to provide both financial and political support for the conservation of land in key areas identified by the Upper Neuse Clean Water Initiative.

Action EP 3.10

Reserved

~~Protection 116~~

The Lower Little Rock Creek Walkable Watershed Concept Plan

Implement the recommendations identified in the plan to enhance pedestrian and bicycle connections, installing green infrastructure along identified corridors to help improve water quality within the watershed.

Action EP 3.11

Protections for Steep Slopes

Study whether the development code should be amended to regulate the regrading and development of steep slopes of 15 percent or greater to conserve the natural contours of the City and prevent soil erosion.

Action EP 3.12

Stream/Watercourse Restoration

Create a program for identifying and prioritizing degraded or channelized watercourses and ~~seasonal~~ streams for future daylighting and restoration, including incentives for undertaking such projects on private property~~.~~ where public benefits such as water quality improvement and flood hazard reduction can be realized.

~~C~~5.4 Flood Reduction and Preparedness

Throughout its history, Raleigh has experienced damaging flash floods from a variety of rainfall events~~.~~ including occasional tropical storms and hurricanes. These events are predicted to grow in severity as climate change impacts are realized. The City's greenway system has acted as an effective buffer for floodwaters, limiting to some degree even more damaging losses. The City needs to ~~adopt a~~further its watershed approach to stormwater management, flood hazard reduction, and flood preparedness. This watershed approach needs to target drainage basins and areas most susceptible to frequent flooding and should define facilities, programs, and policies necessary to improve preparedness and reduce the risks associated with flooding~~.~~

while at the same time protecting and improving water quality. Floodplain areas and drainage basins within Raleigh's jurisdiction are illustrated on Map EP-2. The map shows that the largest floodplain areas are found along the Upper Neuse River and Crabtree and Walnut Creeks.

Policy EP 4.1

Daylighting Streams

Discourage further channelization and piping of streams and focus instead on projects that "daylight" or uncover buried streams. Install bridge systems instead of culverts for stream crossings where feasible in order to help maintain the natural ecosystem associated with the stream~~. (3, 5)~~ , to protect and improve water quality, and to reduce flood hazards within the community. (3, 5)

Policy EP 4.2

Floodplain Conservation

Development should be directed away from the 100-year floodplain. (3, 5) See Text Box: Floodplains.

Policy EP 4.3

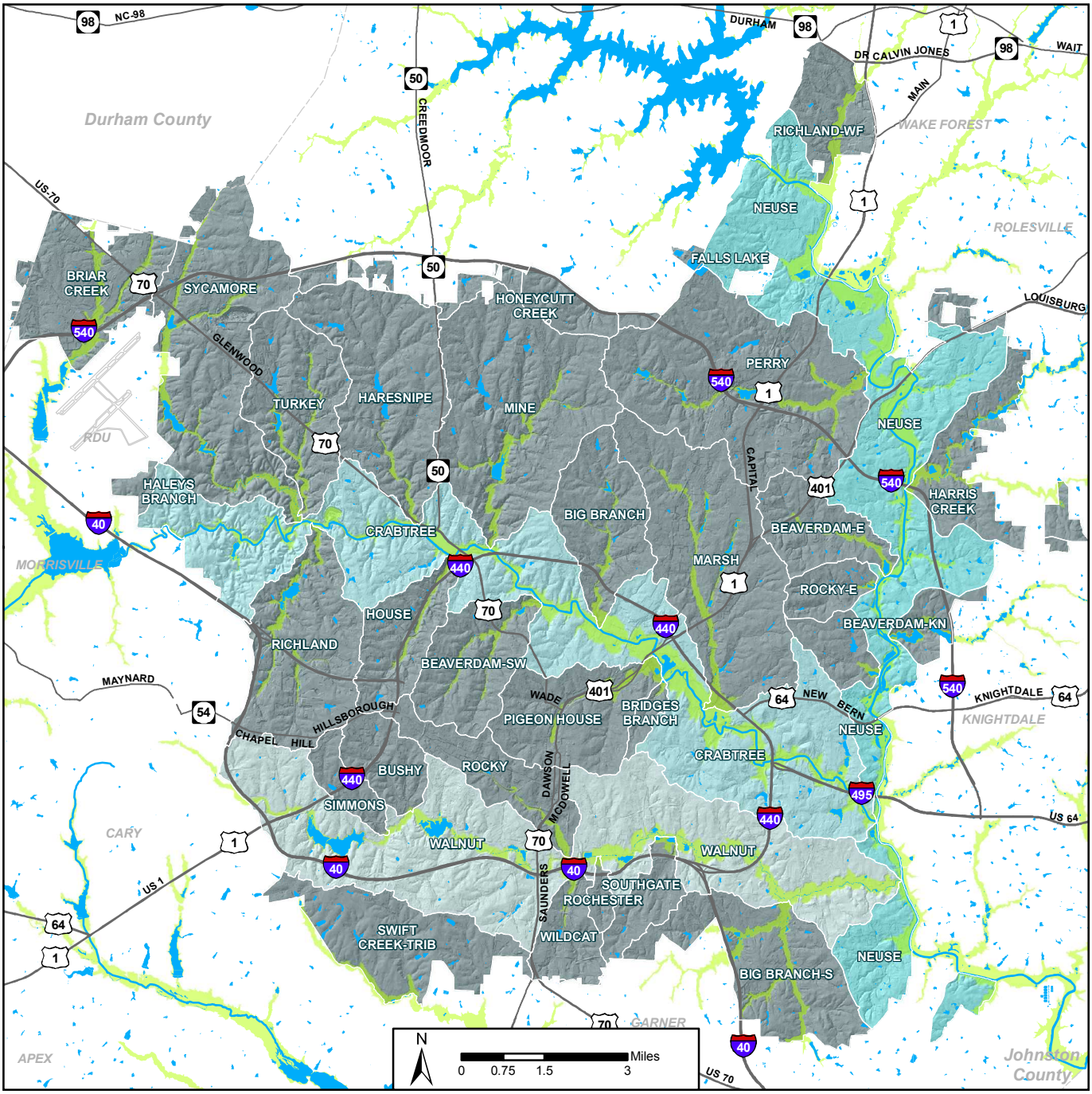
Development in the Floodplain

Pursue regulatory approaches that avoid the future expansion of the floodplain. Floodplain development should not abridge the natural role of floodplains to absorb water, recharge the groundwater, improve water quality, and avoid flooding downstream. (3, 5)

Policy EP 4.4

Revised Version

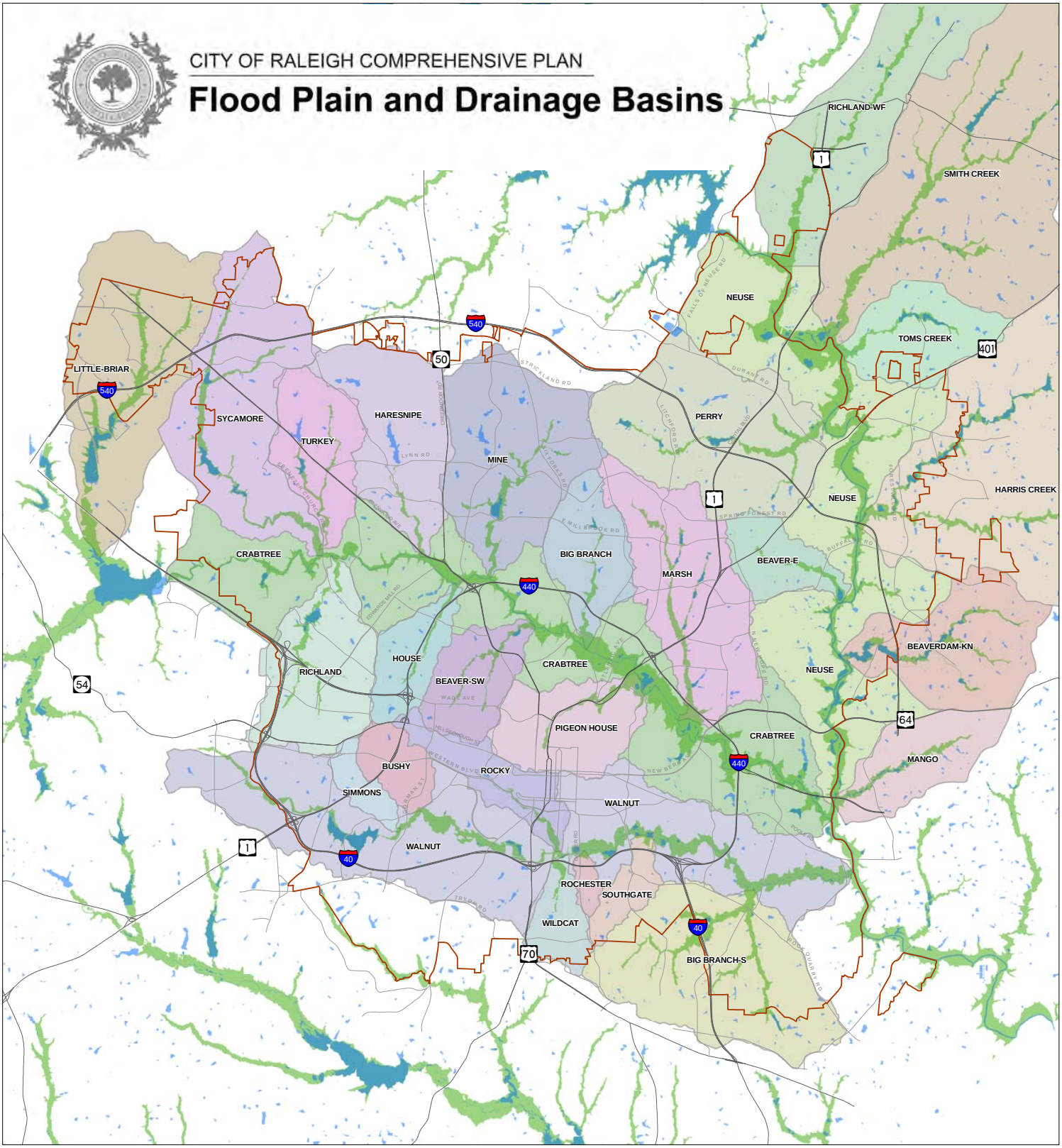
EP-1: **Floodplain and Drainage Basins**



Neuse River Drainage Basin
Crabtree Creek Drainage Basin
Walnut Creen Drainage Basin
Other Drainage Basins
Water
Floodplain

Map created 3/21/2017 by the
City of Raleigh Department of City Planning

Previous Version



MAP EP-2

- Water Bodies
- Flood Plain
- ETJ
- Highway
- Major Streets

N

0 0.5 1 2 Miles

Map created 10/7/2009 by the City of Raleigh
Department of City Planning & GIS Division

Acquisition of Flood-Prone Land

Pursue City acquisition of properties, easements and/or development rights located within the 100-year floodplain to protect public safety, reduce economic damages from floods, and preserve sensitive natural areas. (1, 3, 5)

~~**Floodplains**~~

~~National studies clearly illustrate that the greatest loss of life and highest property damage in flood-prone areas occurs in the flood fringe, where land development continues to be permitted. There is economic justification for prohibiting development in the flood fringe. Additionally, an undisturbed floodplain helps preserve existing vegetation and wildlife habitats, decreases erosion, provides natural stormwater management, improves water quality, and provides land for aquifer recharge~~

Policy EP 4.5

Watercourse Protection

Minimize encroachment into natural watercourse areas and preserve the natural character of watercourses to protect water quality and reduce the potential for flooding and erosion damage. (3, 5) See also C.3 'Water Quality and Conservation'.

Policy EP 4.6

Community Rating System

Continue to participate in the Community Rating System (CRS) to help monitor hazard mitigation efforts and to improve the affordability of flood insurance for residents. The CRS is part of the National Flood Insurance Program that provides flood insurance discounts for communities that go beyond the minimum standards for floodplain management. (3, 5, 6)

Policy EP 4.7

No Adverse Impact

The City shall adopt the principles of No Adverse Impact (NAI) as outlined by the Association of State Floodplain Managers; NAI floodplain management takes place when the actions of one property owner are not allowed to adversely affect the rights of other property owners. Adverse effects or impacts can be measured in terms of increased flood peaks, increased flood stages, higher flood velocities, increased erosion and sedimentation, or other impacts the community considers important. (3, 5)

Action EP 4.1

Reserved

Action EP 4.2

Reserved

~~**Reserved**~~

Action EP 4.3

Floodplain Management Best Practices

Study the floodplain management programs in other cities including Tulsa OK, Louisville KY, and Charlotte NC, and model a flood management program similar to what these communities have accomplished. This includes adopting an enhanced ordinance to both protect floodplains and also reward preservation efforts; and implementing programs that reduce impacts from flooding and further improve the City's CRS~~.~~ class rating.

The Lower Little Rock Creek Walkable Watershed Concept Plan

The Lower Little Rock Creek Walkable Watershed Concept Plan is a cohesive strategy and framework to improve the overall health of the community and the surrounding watershed. This watershed contains a portion of downtown, John Chavis Memorial Park, and surrounding neighborhoods to the east and southeast of downtown. The study area focuses on the lower portion of the Little Rock Creek Watershed, specifically the South Park Neighborhood located southeast of the downtown area. This area was selected based on specific criteria including a community bisected by a creek, proximity to schools and parks, surface water quality impairment, and a lack of infrastructure such as sidewalks, and stormwater management controls. Streets, intersections, and potential sites where infrastructure improvements can be implemented, subject to available funding and citywide priorities, are identified in the plan.

The plan recommends:

- Street opportunities include those streets where sidewalks and natural drainage strategies can be integrated to improve walkability and stormwater management.
- Safe crossings at intersections can be integrated with stormwater treatment to provide safe pedestrian crossings. Intersections lacking crosswalks, greenway access points and intersections where narrow street right of way might limit full block sidewalks are highlighted.
- Stormwater flows include off-street natural drainage opportunities, such as swales and rain gardens that can be aligned with the greenway and sidewalks.
- Greenway access provides additional access points to increase use and activity along the greenway.
- Education opportunities include environmental education signage to improve creek awareness and stewardship. Additional "cues to care" can be incorporated to communicate that natural drainage areas are important.

Action EP 4.4

Floodplain Regulations

Update City development regulations to ensure that any development and redevelopment in floodplain and flood fringe does not adversely affect the flood risks for other properties or communities as measured by increased flood stages, increased flood velocity, increased flows, or the increased potential for erosion and sedimentation, unless such impacts are mitigated in an equal or greater amount. Such regulations should provide exceptions for existing single family lots and developments with minor impacts. Such update shall include a stakeholder process, including but not limited to representatives from the

environmental community, civil engineering, residential and commercial property owners and real estate development community.

Action EP 4.5

Watershed Studies

Complete ~~all drainage basin~~watershed studies to identify existing and future flooding hazards along with water quality needs and erosion ~~damage stemming from drainage on private property~~concerns along with prioritized actions, measures, and capital improvement projects to improve conditions.

5.5 Tree Canopy Conservation and Growth

Raleigh has historically been known as the "City of Oaks" and prides itself on its green image. Trees and forests are integral to Raleigh's identity and also contribute to quality of life and environmental health. Raleigh's trees and forests increase shading, absorb carbon dioxide, mitigate the effects of stormwater runoff and pollution, prevent soil erosion, and facilitate water infiltration into soil.

Raleigh has adopted a tree conservation ordinance as part of the zoning code. The ordinance requires the conservation of existing trees during the development of properties more than two acres in area. In low-density residential districts (R-6 and below), trees on 15 percent of the land area must be preserved. For all other zone districts, tree preservation requirements impact 10 percent of the land area.

As Raleigh grows, it will need to do more to protect its existing urban, suburban, and native trees and forests, and should implement an aggressive program for replanting the City with native trees, when appropriate, to restore the canopy that has been lost to land development.

Policy EP 5.~~3~~ 1

Urban Forestry

Expand and strengthen urban forestry and tree preservation programs to protect the existing tree cover and add to it. (5).

Policy EP 5.2

Tree Canopy Standards

Maintain appropriate tree canopy coverage along 50 percent or more of all available sidewalk planting/ landscape strips between the sidewalk and the curb.

Policy EP 5.3

Canopy Restoration

Promote the reforestation of tree coverage that is typically lost during urban and suburban development through tree conservation, targeted tree plantings, urban forestry, and street tree plantings. (3, 5)

Policy EP 5.4

Tree Selection

Tree species should be selected for site suitability, superior form, disease resistance, regional performance, drought tolerance, urban tolerance, diversity, and mature size by an ISA Certified Arborist or a professional approved by the Parks and Recreation Department's Urban Forestry staff. (3, 5)

Policy EP 5.5

Forested Buffers

Conserve forested buffers along Raleigh's freeways and expressways through the use of Special Highway Overlay Districts and conditional use zoning. (3, 5)

Action EP 5.1

~~**Reserved**~~

Tree Canopy Assessment

Assess tree inventory to quantify carbon absorbed; monitor over time.

Action EP 5.2

Urban Forestry Plan

Work with local arboricultural institutions and agencies to prepare a detailed Urban Forest Plan that outlines how to implement treescape improvements and enhancements throughout the community. The Plan should divide the City into zones in order to accomplish implementation. The City should examine what other North Carolina communities have accomplished with their urban forestry plans.

~~The 2030 Comprehensive Plan for the City of Raleigh~~

Action EP 5.~~5~~ 3

Reserved

Action EP 5.4

Utility Coordination

Coordinate with utility companies to plant, manage, and maintain healthy street trees that can establish mature and natural canopies without interfering with infrastructure operation.

Action EP 5.5

Reserved

Action EP 5.6

NeighborWoods

~~Explore expanding the NeighborWoods residential tree planting program beyond its current funding for 1,500 trees per year.~~

~~C~~Implement an alternating planting/ maintenance cycle to foster the long-term tree survival and financial sustainability of the Neighborwoods program.

5.6 Wildlife and Habitat Protection and Preservation

Rapidly urbanizing communities such as Raleigh are in danger of losing their areas of wildlife habitat. Protecting the diversity of plant and animal species ~~known as "biodiversity"~~ is important.

Raleigh still has the opportunity to protect and enhance its wildlife habitat and a wide range of "priority species~~"~~," including songbirds that are indigenous to North Carolina. "Priority species" of fish and wildlife are identified in the North Carolina Wildlife Action Plan and provide a useful resource for Raleigh's wildlife conservation efforts. For example, the North Carolina Wildlife Action Plan identifies priority species that inhabit some City waterbodies such as Walnut Creek and the Neuse River corridor.

Policy EP 6.1

Aquatic Habitat

Seek to prevent further and/or potential aquatic degradation and impairment of biological communities by strengthening urban stream water quality measures. (5) See also C.3 'Water Quality and Conservation'.

Policy EP 6.2

Seasonal Pools and Streams

Protect and restore seasonal pools and intermittent streams, and their buffers that are home range/ breeding habitat for water dependent species. (3, 5)

Policy EP 6.3

Special Status Species

Place a high priority on protecting rare, threatened, and endangered species habitats and migratory corridors, as defined by Federal and State agencies, from development and its impacts through methods such as land acquisition, park and greenway stewardship, improved development regulations, intergovernmental coordination, and mitigation. (3, 5)

Policy EP 6.4

Biodiversity and City Park Lands

Strive to maintain and improve species diversity and populations in the parks inventory through enhanced plantings and habitat management. (3, 5)

Action EP 6.1

Habitat Plan

Formulate a wildlife habitat plan to define, map, protect, and restore Raleigh's native and priority habitats, particularly those identified in the North Carolina Wildlife Action Plan. The plan should establish a program of action for protecting and enhancing wildlife habitats and preserving biodiversity through a range of strategies including land acquisition, park and greenway conservation and interpretation, augmented development regulations, and intergovernmental coordination. If priority habitats occur outside current City control, seek methods and partnership to conserve the ecological areas.

Action EP 6.2

Habitat Protection Regulations

Determine how to best address conservation, protection, and preservation of wildlife and habitats. Use the body of knowledge, designations and tools available through the NC Natural Heritage Program, NC Wildlife Resources Commission, and other conservation-oriented organizations and agencies. Explore the creation of a wildlife habitat overlay district modeled after that used by the City of Tampa, Florida.

Action EP 6.3

Invasive Species Control

Develop a program to increase awareness of, contain, and possibly eradicate the problem of invasive plants and insects.

~~C~~5.7 Material Resource Management

Comprehensive material resource management does not just include waste management, but also the management of inputs and consumption patterns. While recycling is a big step in the right direction, it is insufficient by itself as a means of achieving sustainability, as it merely deals with a fraction of the resources involved in the current linear system of extraction, production, distribution, consumption, and disposal. In order to be truly sustainable, Raleigh must take more steps toward a closed loop or "zero waste" system of production. Such a system requires that Raleigh maximize its existing recycling and ~~re-use~~reuse efforts, while ensuring that products used by both City staff and City residents are designed for the environment and have the potential to be repaired, ~~re-used~~reused, or recycled.

~~The City is examining replacing the traditional approach to waste disposal with a new paradigm, exemplified by the Cradle-to-Cradle design credo "waste = food," that repositions waste streams as resources. Examples include the commonplace, such as recycling programs and re-use of water; to emerging practices, such as mining of FOG (fats, oils, grease) for biofuels, and producing usable methane from landfills and anaerobic digestion of sanitary wastes.~~

See also H.2 'Solid Waste' in Element H: 'Community Facilities and Services' for related policies and actions.

Policy EP 7.1

Waste BMPs

Promote waste Best Management Practices (BMPs) in all current and future development projects in an effort to reduce the amount of waste produced by development. Explore opportunities to develop

standards to address the waste management hierarchy (avoidance, minimization, ~~re-use~~reuse, recycling, recovery, treatment, and disposal) in design, construction, and demolition stages. (3, 5)

Policy EP 7.2

Waste Minimization

Move away from high energy/high technology methods of waste disposal and more towards waste minimization. A system of incentives and penalties for both the public and private sectors should be created to increase community-level involvement and facilitate public/private partnerships. Zero waste will be the long-term goal of the City. (3, 5)

Policy EP 7.3

Incentives to Waste Reduction

Motivate residents, businesses, and institutions to reduce and recycle waste, including construction and demolition debris, through appropriate incentives and disincentives. (3, 5)

Policy EP 7.4

Public Awareness of Waste Impacts

Promote public awareness regarding the implications of solid-waste generation on the environment, and the consumption and disposal practices that result in less waste generation as well as more efficient, environmentally sound use of resources. (5)

Policy EP 7.5

Source Reduction

Reduce the sources of solid waste through increased education and outreach programs and through increased recycling and composting. ~~(5)~~ (5) The City is examining replacing the traditional approach to waste disposal with a new paradigm, exemplified by the "Cradle-to-Cradle" design credo "waste = food," that repositions waste streams as resources. Examples include the commonplace, such as recycling programs and reuse of water; to emerging practices, such as mining of FOG (fats, oils, grease) for biofuels, and producing usable methane from landfills and anaerobic digestion of sanitary wastes.

See also H.2 'Solid Waste' in Element H: 'Community Facilities and Services' for related policies and actions.

Policy EP 7.6

Municipal Waste Reduction

Further increase waste reduction and conservation by City employees; increase product-substitution, recycling and the purchase and use of recycled goods, and ensure that less toxic and sustainable alternative products such as chlorine-free paper and PVC-free plastics are actively supported and used. (3, 5)

Policy EP 7.7

Community Participation in Recycling

Increase community (resident and business) participation in recycling programs through the use of communications, quantification, and competition. (3, 5) (See also C.9 'Environmental Education, Awareness and Coordination' for more on this topic).

Policy EP 7.8

Food Waste Composting

Investigate and pursue appropriate opportunities for food waste composting, ranging from individual household composting to regional organic waste composting. (5)

Policy EP 7.9

Construction and Demolition Recycling

Promote the ~~re-use~~reuse of waste from building demolition and construction, including the recycling of lumber and brick, and salvage of usable fittings and hardware. (5, 6)

Policy EP 7.10

Businesses Using Recycled Output

Support economic development efforts aimed at enhancing existing and developing businesses that can utilize local secondary materials as feedstocks. (5)

Policy EP 7.11

Waste-to-Energy

Continue to operate a methane gas recovery system, and promote further research into new and clean technologies for the conversion of organic waste into energy. (3, 5) See also H.2 'Solid Waste' in Element H: 'Community Facilities and Services' for an additional Waste-to-Energy policy.

Action EP 7.1

Pay-As-You-Throw

Create a "Pay-As-You-Throw" Program that utilizes a volume-based disposal fee system to encourage residents and contractors to reduce waste. Such action will require increased vigilance against illegal dumping.

Action EP 7.2

Reserved

Action EP 7.3

Waste-to-Energy Demonstration

Partner with the North Carolina Cooperative Extension and related institutions, agencies, and organizations to explore and develop a demonstration waste-to-energy project.

Action EP 7.4

Environmentally-Friendly Product Use

Work with regional agencies to explore options for assuring the use of compostable plastic, recyclable paper, and/or re-usable checkout bags by stores throughout the region, as well as a reduction in the use of polystyrene foam (~~styrofoam~~Styrofoam) food service containers, including those in the City of Raleigh (similar ordinances in other cities apply to grocery stores with gross annual sales exceeding two million dollars, and pharmacies with five or more City locations; penalties apply for organizations in violation).

Action EP 7.5

Reserved

Action EP 7.6

Demolition Debris

Require a waste diversion statement to be submitted at the time of application for a demolition permit; the statement should include a list of material types and volumes anticipated from the demolition and the market or destination for those materials. Consider requiring the same for construction permits.

Action EP 7.7

Environmentally Preferable Purchasing

~~Enact a Sustainable Purchasing Policy for the City of Raleigh and its contractors.~~ Expand on current policy by including specific goals for toxic pollution reduction, recycled content products, energy and water savings, green building construction and renovation, landscaping, forest conservation, and agricultural bio-based products.

~~C~~5.8

Light and Noise Pollution Controls

Excessive, poorly designed outdoor lighting wastes electricity, disturbs natural habitats, and increasingly deprives many of us of a direct relationship with the night ~~time~~ sky. The City of Raleigh seeks to minimize light pollution, glare, and light trespass; conserve energy and resources while maintaining night time safety, utility, security, and productivity; and curtail the degradation of the ~~night time~~nighttime visual environment. Similarly, noise pollution from highway and airport traffic disturbs quality of life, and should be mitigated appropriately.

Policy EP 8.1

Light Pollution

Reduce light pollution and promote dark skies by limiting the brightness of exterior fixtures and shielding adjacent uses from light sources, provided safety is not compromised. Minimize flood lighting and

maximize low level illumination. Promote the use of efficient, full cut-off lighting fixtures wherever practical. Full cut-off fixtures emit no light above the horizontal plane. (5, 6)

Policy EP 8.2

Light Screening

Prohibit unshielded exterior lamps and limit the lighting of trees and other vegetation through the use of shielded fixtures and footcandle limits. (5, 6)

Policy EP 8.3

Night-time Light Impacts

Uses that can turn off outdoor lighting during night hours are to be encouraged in areas with uses sensitive to night-time light impacts. Uses which require all-night illumination are to be discouraged in these areas, while ensuring that actual and perceived night-time safety is maintained. (5, 6)

Policy EP 8.4

Noise and Light Impacts

Mitigate potential noise and light pollution impacts from new development on adjoining residential properties. (3, 5, 6)

Policy EP 8.5

Airport Overlay Zone

Keep the boundaries of the Airport Overlay District zone current with the future expansion plans of Raleigh-Durham International Airport to protect residents from impacts of increased flight patterns and activity. (3, 5, 6)

Policy EP 8.6

Expressway Noise

Protect residents from excessive roadway noise by requiring appropriate mitigation measures, such as landscaped buffers or noise walls, for all new expressways that generate excessive levels of noise. (5, 6)

Policy EP 8.7

Noise Codes and Regulations

Maintain and enforce the building codes, regulations, and other applicable standards that mitigate noise impacts. (5, 6)

Policy EP 8.8

Noise and Environmental Justice

Ensure that residents of all income levels throughout the City of Raleigh are equally protected from excessive roadway noise. (1, 4, 6)

Policy EP 8.9

LED Lighting

Use high-efficiency Light-Emitting Diode (LED) lighting for outdoor illumination where feasible; newer technologies should be considered as they become available. (1, 5)

Policy EP 8.10

Airport Noise Protection for Residential Uses

Rezoning of properties within the defined 65 ~~dnl~~decibel level of Raleigh Durham Airport Authority composite noise contour line and outside the Airport Overlay District, that propose to increase residential density or create new ~~residential~~resi¬dential zoning is strongly discouraged. ~~Exceptions~~Excep¬tions to such rezoning may occur through a conditional use rezoning that adopts Raleigh Durham Airport Authority recommended noise mitigation measures.

Action EP 8.1

~~**Reserved**~~

Non Essential Lighting

Explore programs to dim non-essential parking lot or building lights overnight, which can be reactivated by a motion sensor.

Action EP 8.2

Dark Sky Incentives

Develop a package of incentives and/or credits to promote the utilization of energy-efficient, full ~~cut-off~~cutoff lighting fixtures that minimize glare and light pollution.

~~C~~5.9 Environmental Education, Awareness and Coordination

One of the most important efforts that the City of Raleigh should undertake to protect, conserve, and steward the environment is to offer residents access to comprehensive environmental education programs and activities. According to the North American Association for Environmental Education, "The goal of environmental education is to develop a world population that is aware of and concerned about the environment and its associated problems and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones."

Policy EP

9.1

Environmental Education

Develop and promote permanent environmental education and interpretive facilities and programs to foster broad public awareness of environmental issues and consequences and to promote greater appreciation and stewardship of our natural resources both locally and globally. (3, 5)

Policy EP 9.2

Environmental Justice Education

Educate local decision-makers on the principles of environmental justice to promote equitable distributions of environmental burdens (pollution, industrial facilities, waste disposal, truck traffic, noise, etc.) and access to environmental goods (nutritious food, clean air and water, parks, recreation, health care, education, transportation, safe jobs, etc.). (1, 5, 6)

Policy EP

9.3

Environmental Stewardship

Optimize the appreciation, use, and stewardship of Raleigh's natural resources including its wildlife and habitats, flora and fauna, and waterways and floodplains to foster broad public awareness of the connection between humans and nature. Enlist the support of local colleges and universities in targeted research and other projects to meet regional environmental goals. (3, 5, 6)

Policy EP

9.4

Environmental Oversight

Provide adequate oversight during the construction phase for all City capital projects to ensure applicable federal, state and local ordinances and environmental standards are met. (5)

Policy EP 9.5

Promoting Local Products

Promote the public health and environmental benefits of supporting locally-produced foods, goods, and services. (5)

Policy EP

9.6

Local Produce and Farmers Markets

Encourage the creation and maintenance of produce markets throughout Raleigh to provide outlets for healthful and locally-grown produce for residents. Support growing, harvesting, selling and delivery of locally-grown produce. Target areas within limited access to traditional food markets. (5, 6)

Policy EP 9.7

Cooperation with Conservation Groups

Promote cooperation with conservation and land trust groups through the City's Upper Neuse Clean Water Initiative so City resources can be carefully coordinated with other land acquisition programs. (3, 5)

Policy EP 9.8

Landscaping and Gardening

Encourage environmentally responsible landscaping and gardening practices to reduce water use and water pollution, including increased use of ~~drought resistant~~droughtresistant and native plants and reduced use of pesticides. (3, 5)

Policy EP 9.9

Food Systems Education

Partner with community garden sites and encourage schools to develop an educational program that educates students about food systems, healthy eating, and food security.

Action EP 9.1

Environmental Education Programs

Expand environmental education offerings, (including master gardener programs) at City parks including, but not limited to, Annie Louise Wilkerson Nature Preserve, Horseshoe Farm Park, Lake Johnson Park, Anderson Point Park, Durant Nature Park, and the future Raleigh and Walnut Creek parks. Promote these offerings through web sites and other correspondence with residents.

Action EP 9.2

Public School Environmental Component

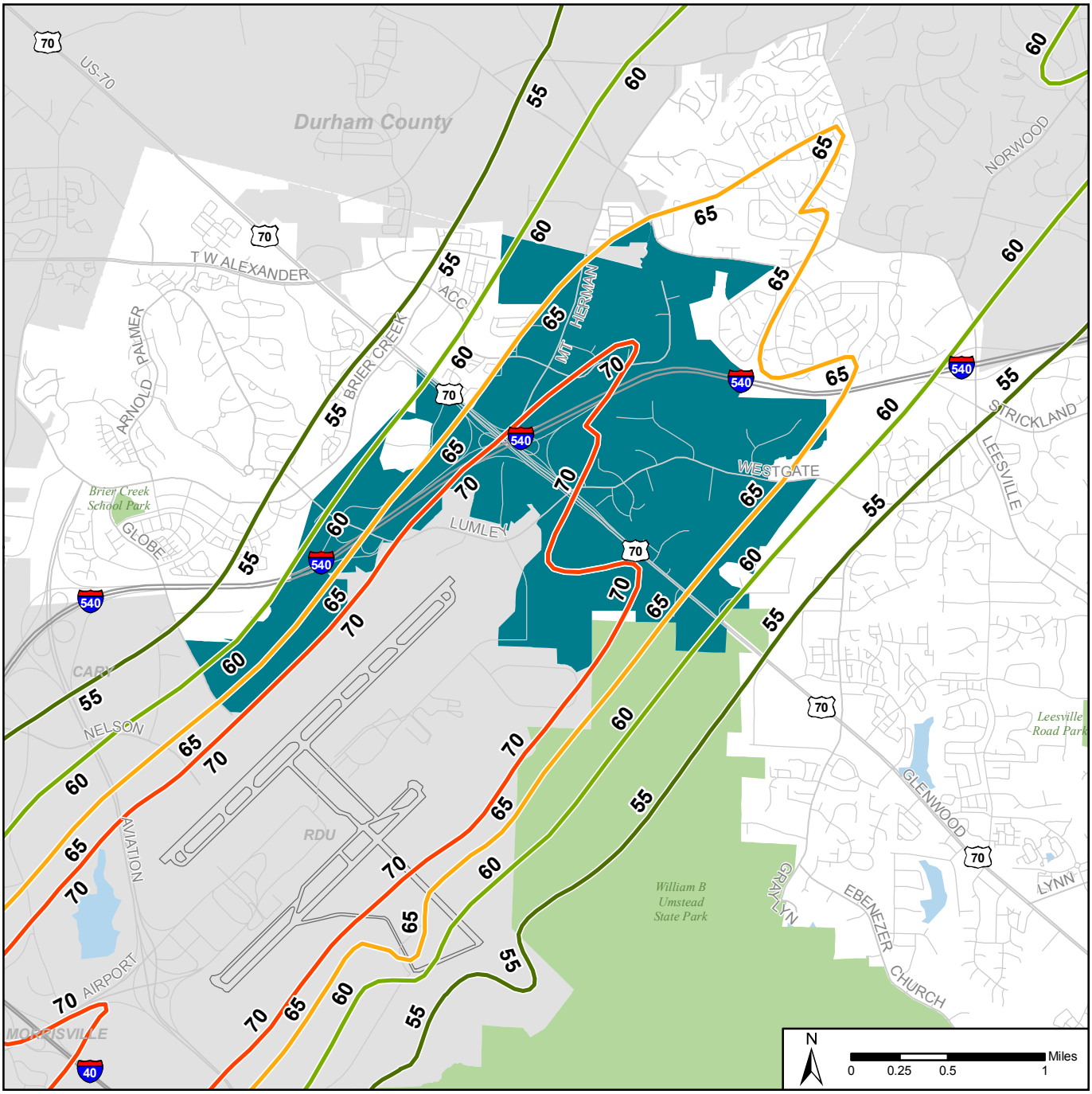
Encourage Wake County public schools to incorporate an environmental education component in the school curricula.

Action EP 9.3

Renewable Energy Education

New Map

EP-2: **Airport Overlay District and Noise Contours**



Airport Overlay District

Airport Noise Contours

- 55 Average Daily Decibels
- 60 Average Daily Decibels
- 65 Average Daily Decibels
- 70 Average Daily Decibels

Map created 3/17/2017 by the
City of Raleigh Department of City Planning

In ~~partnership~~conjunction with ~~NC GreenPower~~community partners, conduct a public education and outreach effort to encourage the purchase of renewable energy options from local providers.

Action EP 9.4

Local Food Systems

Explore opportunities to develop and expand local food systems (including community gardens and urban farms) that provide opportunities for residents to grow their own produce as well as learn and use organic gardening techniques. The City should identify publicly-owned sites that may be suitable for community gardens and urban farms, work with advocacy groups to make these sites available, and manage them. Coordinate with yard waste collection and community composting.

~~Additional Actions~~

Action EP 9.5

Environmental Indicators

Create and maintain an Environmental Indicators Report documenting environmental trends.

Action EP 9.6

Reserved

~~-~~**Action EP 9.7**

Community Gardening Grants Administer a grants program to help distribute funds to non-profits and community organizations that manage community gardens in Raleigh.

Action EP 9.8

Community Gardening Feasibility Study Conduct a study to determine locations where community gardens would provide the most benefit to the surrounding community. Lower income communities classified as food deserts which have historically had issues related to environmental justice should be given the highest priority, when allocating funding and resources for community gardens.